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Evaluation of knowledge, attitudes and behaviors about COVID-19 among cancer patients

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Abstract
Aim: COVID-19 pandemic is experienced intensely with variants in our country, as in other countries. The presence of cancer in patients is associated with morbidity and mortality in the course of COVID-19 disease. In this study, we aimed to evaluate the level of knowledge, attitude and behavior regarding coronavirus disease in cancer patients.
Material and Methods: The questionnaire, consisting of three sections and 25 questions measuring knowledge, attitudes and behaviors of cancer patients about COVID-19, was filled face-to-face by each patient in July 2020.
Results: Most of the cancer patients were aware of the symptoms related to COVID-19 and applied the protection methods such as wearing masks, hand washing, and social distance. Participants with higher levels of education had significantly higher knowledge levels. Although half of the patients were worried about continuing cancer treatment during the pandemic process, 70 % of the patients did not think of delaying the treatment; 48.7 % of the patients were informed by the oncologists about COVID-19 infection. The majority of patients expressed that they did not receive supportive products during the COVID-19 outbreak.
Discussion: In general, cancer patients were conscious of the pandemic, but nevertheless, during this period, they showed a high compliance with their doctors.

Keywords
Attitudes, Behaviors, Cancer, COVID-19, Knowledge

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Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which caused the pandemic of COVID-19 (Coronavirus disease-2019), started in December 2019 in Wuhan city, China, affecting the whole world, causing the death of thousands of people [1]. This pandemic was recognized by the World Health Organization on January 30, 2020 [available at: http://www.euro.who.int/en/health-topics/emergencies/pages/news/news/2020/01/2019-ncov-outbreak-is-an-emergency-of-international-concern]. The first identified COVID-19 case in Turkey was announced by the Ministry of Health on March 11, 2020.

This virus causes deadly pneumonia leading to acute respiratory failure syndrome [2]. Elderly people and patients with comorbidity are more likely to become infected. In addition, serious complications such as acute respiratory distress syndrome (ARDS) are observed more frequently in these individuals [3]. Cancer patients have lower immunity than other people due to both cancer and immunosuppressive therapy, making them more susceptible to infections [4]. Accordingly, we can say that cancer patients infected with SARS-CoV-2 coronavirus are more risky than other populations. In this context, cancer care was immediately established as a health priority by the National Medical Council and the Ministry of Health.

In one study, the disease was more severe in cancer patients than in non-cancer patients [5]. Another study found that cancer patients diagnosed with COVID-19 had a 2.3 times higher risk of death, a 2.8 times higher risk of needing intensive care, and a 2.8 times higher risk of developing at least one serious symptom than those without cancer. However, utilization of invasive mechanical ventilation was determined higher in patients with cancer [6]. Recently, many vaccines against coronavirus have been developed and social vaccination programs have been initiated in many countries. However, strong infection control measures still need to be implemented [7].

The European Society of Medical Oncology (ESMO) guidelines for the management of cancer patients during the COVID-19 outbreak should prioritize adjuvant therapies in patients with resected high-risk diseases that are expected to achieve a significant absolute survival benefit. Similarly, the benefits and risks of palliative treatments during pandemic should be discussed. "Treatment holidays", "Stop and Go", if available, maintenance and transition to oral medications should be considered [available at: https://www.who.int/news-room/q-a-detail/q-a-coronaviruses].

There is very limited data in the literature regarding the knowledge levels, thoughts, behaviors and attitudes of cancer patients towards COVID-19. Knowledge about COVID-19 is ever-expanding and changing as the virus mutates. In addition, there is a lot of information pollution on this subject in the written and visual media. Thus, patients should be informed accurately by their oncologists about the risks associated with the pandemic process and cancer treatment so that they can better comply with pandemic measures as well as cancer treatment. In this study, we aimed to evaluate the knowledge, attitudes and behaviors of cancer patients about COVID-19 who applied to our clinic during the rapidly rising pandemic. This study also can provide useful data to plan health education programs about COVID-19 among cancer patients.

Material and Methods

A cross-sectional prospective single-center study was executed using a survey to evaluate the level of knowledge, attitude and behaviors of cancer patients in response to coronavirus disease. This study was approved by Karadeniz Technical University Medical Faculty, Medical Oncology Outpatient Clinic in July and August, 2020.

The survey, consisting of 25 questions in total, was outlined into 3 sections. In the first section, patients were asked general information about COVID-19. In the second section, questions were raised about their thoughts on prevention methods. In the third part, questions were asked about the COVID-19 outbreak and cancer. For simplicity and clarity, the majority of options were created as "yes, no or not sure". Questions were given one point for correct response and zero points for incorrect or unsure answers.

A preliminary phase was made to evaluate the validity and reliability of the questionnaire prior to its use. The survey was pre-tested on 15 participants who were excluded from the study sample. The patients were requested to fill the questionnaire twice one week apart. Internal consistency reliability was evaluated using Cronbach's alpha. Cronbach's alpha value of the pilot study was 0.90 and the intra-class correlation coefficient was 0.83. In other words, the results showed sufficient internal consistency reliability.

The sample size was calculated using the open.Epi (Open source epidemiologic Statistics for Public Health) software. At a 95% confidence interval, the calculated sample size was 197 contributors, and we included 220 participants in the study.

Patients who were over 18 years of age, who had normal intelligence levels as clinical observation and who did not have organic brain syndrome, who were not in the terminal period of cancer, and who agreed to the study were included in the study. Individuals with brain metastasis or primary brain tumors were not included in the study site and subjects.

Statistical Analysis

The SPSS program was used for the analysis of the data. Descriptive statistical analysis was applied for identifying the items included in the questionnaire. While applying the analyses, we presented continuous numeric variables with normal distribution as mean ± standard deviation. Also, those without normal distribution as median, minimum, and maximum values, and percentages were used to describe categorical data. The suitability of the data for a normal distribution was analyzed using the Kolmogorov-Smirnov test. Comparison of numerical variables between independent groups was analyzed using the Mann-Whitney U test and the Kruskal-Wallis test because the normal distribution condition was not met. The Bonferroni test from the posthoc test statistics was used to determine the source of the significant difference between the groups. P-values <0.05 were considered statistically significant.

Ethical Considerations

The study was approved by the Ethics Board Committee of Karadeniz Technical University Medical Faculty (Ref No: 24237859-455 Date: 03.07.2020), and ethical principles laid down in the Declaration of Helsinki have been followed.

Results

Participant characteristics

A total of 220 patients participated in the survey. One hundred and eight of the patients (49.1%) were female and 112 (50.9%) were male. Most of the patients were married (90.5%). The majority of the patients involved in the study lived in the family home (98.2%), and 56% of the patients had education less than a high school degree. About half of the patients had a history of one or more chronic diseases (48.6%). Most of the diagnoses the patients had were gastrointestinal cancers (33.2%) and breast cancer (26.8%). Additionally, 41% of these patients were metastatic; 59% were nonmetastatic. The ECOG performance scores of 87% of patients were 0 and 1; the rest were 2 and 3 (Table 1).

Results of the Questions Related to Attitudes and General information of cancer patients about COVID-19

The majority of patients (72.7%) claimed that they had never heard the word "pandemic" before. The most commonly used information sources were written and visual media (TV, newspaper etc.) (89%). Almost all the participants answered the question about where the outbreak first appeared correctly. The majority of the patients (87.3%) knew the route of transmission of the virus; 90% of patients reported fever, cough and fatigue as main symptoms; 90% of the patients thought that most patients could overcome this infection with early treatment. The majority (85.9%) stated that the COVID-19 disease would be more severe in those with chronic disease. While 85% of the patients who participated in the survey thought it is beneficial to wear a mask to prevent the transmission of the virus, 10% reported that it was not useful; 68.6% of the patients answered the question of whether people with COVID-19 can transmit the virus to others when they have no fever and cough, and 14.5% said it cannot be transmitted; 86.4% of the patients stated it was wrong that the children and young adults do not need protection because they are not affected by COVID-19. The majority of patients (99.1%) responded correctly to the question that hands should be washed at least 20 seconds to prevent contamination (Table 2).

Table 1. Relation between socio-demographic characteristics of the participants and their knowledge scores about COVID-19

Socio-demographic Characteristics	N (%)	Knowledge score	Knowledge score	Test of sig.(p)
		Min-Max	Mean±SD	
Sex				
Female	108 (49.1)	4-11	9.93±1.54	P=0.518
Male	112 (50.9)	3-11	9.83±1.56	
Age (years)				
18-35	10 (4.5)	8-11	10.4±1.07	P=0.427
36-50	43 (19.5)	4-11	9.90±1.75	
51-65	119 (54.1)	3-11	9.93±1.42	
>65	48 (21.8)	5-11	9.64±1.75	
Martial Status				
Married	199 (90.5)	3-11	9.82±1.58	P=0.06
Never-Married	10 (4.5)	10-11	10.90±0.31	
Others*	11 (5.0)	8-11	10.05±1.36	
Who lives with				
Living with family	216 (98.2)	3-11	9.87±1.56	0.202
Living alone	4 (1.8)	10-11	10.75±0.50	
Educational Background				
Illiterate	14 (6.4)	3-11	7.64±2.70	P<0.01**
Primary school	109 (49.5)	4-11	9.92±1.42	
High school	66 (30)	5-11	9.92±1.29	
University	31 (14.1)	8-11	10.67±0.74	
Job				
Working	32 (14.5)	6-11	10.09±1.32	P=0.35
Not-working	188 (85.5)	3-11	9.85±1.59	
Comorbidities				
Absent	113 (51.4)	4-11	10.06±1.42	P=0.089
Present	107 (48.6)	3-11	9.71±1.66	
Evre				
Metastatik	90 (40.9)	3-11	9.71±1.84	P=0.59
Non-metastatic	130 (59.1)	4-11	10.00±1.31	
ECOG-PS				
0-1	192 (87.3)	3-11	9.85±1.59	P=0.46
2.3	28 (12.7)	7-11	10.10±1.22	

*"Others" included widowed and divorced. **Statistically significant at $p < 0.05$

Table 2. General Information and Attitudes of Participants about COVID-19

Questions (based on interpretation)	Responses		
	n (%)	n (%)	n (%)
1. Have you ever heard the word "Pandemic"?	53 (24.1) Yes	160 (72.7) No	7 (3.2) Not Sure
2. Where do you get the most information about COVID-19 pandemic?	196 (89) Written and visual media	15 (6.8) Internet	9 (4.2) Doctors
Questions (for knowkedge score)		Right Answer n (%)	Wrong Answer* n (%)
3. Where did the COVID-19 outbreak first begin and spread to the world and our country?		219 (99.5)	1 (0.5)
4. COVID-19 virus is mostly transmitted by respiratory droplets.		192 (87.3)	28 (12.7)
5. The main symptoms of COVID-19 are fever, dry cough, fatigue and muscle pain.		200 (90.9)	20 (9.1)
6. With early supportive treatments, most patients can get rid of the infection.		200 (90.9)	20 (9.1)
7. COVID-19 disease can be more serious in those with chronic disease such as advanced age, diabetes, hypertension and cancer.		189 (85.9)	31 (14.1)
8. Should avoid crowded places and close contact with other people.		218 (99.1)	2 (0.9)
9. There is no benefit in wearing a surgical mask to prevent transmission of the COVID-19 virus.		188 (85.5)	32 (14.5)
10. People with COVID-19 can not transmit the virus to others when they do not have fever and cough.		151 (68.6)	69 (31.4)
11. Children and young adults are not affected by the COVID-19 virus, so they do not need to take action.		190 (86.4)	30 (13.6)
12. Hands should be washed with soap and water for at least 20 seconds to prevent transmission of the COVID-19 virus.		218 (99.1)	2 (0.9)
13. How many days the people who come into contact with someone who is infected with the coronavirus should be observed in quarantine ?		210 (95.5)	10 (4.5)

*Incorrect answers or unsure answers

Knowledge Score about the COVID-19 of cancer patients

As a result of participants' responses, we calculated the knowledge score according to questions 3-13 in the survey. When calculating this score, only correct answers were accepted from the three options. The total knowledge score varied between 3 to 11, with a mean of 9.88 ± 1.55. The relation between socio-

demographic characteristics and knowledge scores about COVID-19 is demonstrated in Table 1. Nearly similar knowledge mean scores were observed for male and female participants (9.93 ± 1.54 vs 9.88 ± 1.56, respectively) with no statistically significant difference. Also there were no statistically significant differences in information scores according to age groups ($p>0.05$) and marital status ($p= 0.06$). As expected, knowledge mean scores were significantly correlated with education level ($p<0.001$). Contributors in the survey with university or higher education had significantly higher knowledge mean scores compared to those with lower levels of education (Table 1).

Results of the Questions Related to Cancer and COVID-19 Outbreak

In the third part of the survey, questions were asked about the COVID-19 outbreak and cancer. Due to the data showing that COVID-19 disease will progress more seriously in cancer patients, the participants were asked about this, and 87.7% stated that they thought so. During the COVID-19 pandemic period, 38.6% of the patients stated that their examinations should be done on time, despite the risk of transmission, and the remaining patients wanted to postpone. Half of the cancer patients thought that the COVID-19 outbreak did not prevent cancer patients from continuing their treatment, however, 27.3% thought it was an obstacle. Half of the patients were concerned about the continuation of cancer treatment during the pandemic. Most of those who were concerned expressed that they were more afraid of the COVID-19 transmission than disruption of their cancer treatments.

All of the patients said they wore masks when they left the house during the outbreak; 72.7% of the patients stated that they came to the hospital with one relative, and the majority of patients stated they were paying attention to social distance with other people; 82.7% of the patients thought that they implemented the general measures adequately to protect against the disease. The majority of patients expressed that they did not receive supportive products because of cancer during the period of the COVID-19 outbreak (Table 3).

Table 3. Questions about cancer and COVID-19 outbreak

Items (same order in the questionnaire)	Responses		
	n (%)	n (%)	n (%)
14. Is COVID-19 more serious in cancer patients?	193 (87.7) Yes	5 (2.3) No	22 (10.0) Not Sure
15. What do you think about the control tests in patients with cancer who are being followed up during the COVID-19 pandemic period?	24 (10.9) I prefer to postpone control examinations due to the risk of COVID-19 contamination.	85 (38.6) I would like to have my tests scheduled despite the risk of transmission	11 (50.5) I prefer to consult my doctor for the control time if I have no symptoms
16. Do you think the COVID-19 outbreak prevents the continuation of the treatment of patients receiving cancer treatment?	60 (27.3) Yes	110 (50) No	50 (22.7) I have no idea
*17. Are you concerned about the continuation of your cancer treatment during the period of the COVID-19 outbreak?	110 (50) Yes	110 (50) No	
*18. If your answer is "Yes" for the question 17, which of the following are you more concerned about?	80 (72.7) COVID-19 transmission scares me more than disruption of my cancer treatment	30 (27.3) Disruption of my cancer treatment scares me more than the COVID-19 transmission.	
19. By coming to hospitals, your risk of getting COVID-19 infection increases. So have you ever thought about delaying your treatment?	56 (25.5) Yes, I thought	155 (70.5) No, I want to continue my treatment by following the necessary preventive measures.	9 (4.0) I have no idea
20. Did your oncology doctor inform you about the COVID-19 infection?	107 (48.7) Yes	94 (42.7) No	19 (8.6) I don't remember
21. Do you wear a mask when you leave the house during the COVID-19 outbreak?	220 (100) Yes	0 (0) No	0 (0) I wear only in the hospital
22. How many relatives accompany you while coming to the polyclinic?	32 (14.5) I'm coming myself	160 (72.7) One relative	28 (12.7) Two relatives
23. Are you careful to keep the distance (at least 1 meter) from other people?	208 (94.5) Yes	3 (1.4) No	9 (4.1) Sometimes
24. Do you think you have implemented the general measures (hand hygiene, social distance, mask use, etc.) adequately to prevent the COVID-19 outbreak?	182 (82.7) Yes	5 (2.3) No	33 (15.0) Partially
25. Do you receive additional protective or supportive products because of cancer during the COVID-19 outbreak?	30 (13.6) Yes	5 (60.9) No	33 (25.5) I always ask my doctor

Discussion

We aimed to learn knowledge levels, attitudes, behaviors and concerns of our cancer patients about COVID-19. As a result of the questions, the knowledge level of the patients was generally high, and this situation was even higher, especially in patients with high educational levels. In similar studies in the literature, the knowledge levels of the people about COVID-19 were found to be related to their education levels [8,9]. Likewise, the knowledge levels of the patients about the methods of protection from COVID-19 were also found to be high in our study.

However, while the majority of patients stated that they had not heard the word ''pandemic'' before, they mostly received information about COVID-19 from visual and print media such as TV and newspapers. It was determined that they received much less information from the internet. Unlike our study, in a study conducted with a healthy population in Egypt, the most frequently referenced sources of information about COVID-19 were social media platforms and the internet [10]. This may be related to the fact that more than half of our patients have a low education level and are not able to use the internet effectively. Although the COVID-19 outbreak affects the entire population, it has also been shown by a study conducted in China that this disease can be more serious in cancer patients and that the mortality due to COVID-19 disease is approximately 3 times higher in cancer patients [7]. In this study, we tried to observe how the COVID-19 pandemic affected cancer patients, their concerns, their opinions about follow-up and treatments. Half of the patients had concerns about the continuation of cancer treatments during this period. The vast majority of concerned patients stated that the COVID-19 transmission made them more anxious than the disruption of cancer treatment. Despite this, it was seen that 70% of the patients did not think of delaying treatment. In light of these data in this study, it was observed that the cancer patients adapted to the treatment at a high rate during the pandemic process. Another finding indicating patient-doctor compliance was that only about 11% of the patients under follow-up wanted to postpone their follow-up visits, and half of the patients wanted to their follow-

up programs to be in line with the recommendations of their doctors. We think these are very important data for oncologists. Interestingly, less than half of the patients stated that their oncologist informed them about COVID-19. The reason for this may be that there were no clear guidelines for follow-up and treatment of cancer at that time. Especially during this epidemic period, there is increasing information pollution regarding the use of additional supplements for protection from COVID-19 on television, social media and the internet. Based on our question, the majority of our patients (60.9%) stated that they did not take any additional protective or supportive products. In a similar study on cancer patients in our country, more than half of the patients (52.3%) were taking additional nutritional supplements [9]. Such supportive treatments should be evaluated individually and applied by professionals.

Our study has several limitations. The survey was conducted rapidly on 220 patients in a one-month period, because there was no data on this subject when this study was designed, but it was completed late because of the pandemic conditions. The other limitation of this study is related to questionnaire because we want to learn our patients' opinions about COVID-19 with cancer disease, so some of the questions we write for patients to choose have two choices and some of them have three choices. This caused some difficulties in calculating the knowledge score. We had to exclude some interpretative questions from the knowledge score.

Conclusion

In general, cancer patients were conscious of the pandemic in this study. Despite patients' fears about the pandemic, it was observed that the treatment compliance of cancer patients was high. As the pandemic continues spreading especially for our country, more multicenter studies in a special population such as cancer are needed. This study can provide useful data to plan health education programs about COVID-19 among cancer patients individually.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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